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THE CHRISTIAN ALMANACK FOR 1836.

Of the various Almanacks published in the United Kingdom, we consider this the cheapest and the best, Within a very small compass, it contains a mass of instructive and valuable information. The figure work seems to be very accurate, and the information regarding the eclipses, and other astronomical observations, is of a description which proves it to be from the pen of one competent to the task. There is, however, too great a mixture of matter for our taste; the extracts we give, though taken at random, will afford an idea of this want of classification. But we should rather suppose, there is a design in this, namely—to induce the reader to go through the entire of the book, and thus read all. In reference to the appearance of Halley's Comet (of the path of which, it will be remembered, we gave an engraving at the beginning of the last year, with an accurate description) are the following observations:—

"It was first discovered at Rome, at the Observatory of the Collegio Romana, on the 5th of August. Cloudy weather followed, which, together with the great glare of the moonlight, prevented further discovery in Europe till the 22d of August, when it was seen at Berlin, and on the 23d it was discovered in England. The close agreement between its predicted place and the path it is actually pursuing, is truly astonishing. When we consider the nature of the body in question, the length of its period, (75 years,) and the very small portion of its orbit in which it can be observed, it is a great triumph of science, and adds an additional proof, if one was required, of the truth of the great laws of nature as laid down in the philosophy of Newton.

"There is reason to believe that an appearance of this Comet can be traced back as far as 130 years before the Christian era; also that it is the same Comet that was seen in the years 323 and 399: in the latter year it is described as of prodigious magnitude and horrible aspect. It, again, in all probability, was the same as those seen in the years 550, 855, 930, and 1006; at this last appearance it was described as being four times as large as the planet Venus. It was also visible in 1230, 1305, and 1380. Up to this time we have only the successive periods of 75 or 76 years' interval, or double interval, &c. to enable us to identify the Comet; but from the last-named epoch the succeeding returns are free from doubt, as observations were made of sufficient accuracy to determine its identity. In 1456 its appearance is stated to have been terrific, and regarded in Europe as an omen of ill; the Turks being then engaged in a successful war against the Greeks, in which they overthrew the latter empire. The tail of the Comet, at this time, is said to have been 60 degrees in length, and of the form of a Turkish sabre; it was universally regarded with astonishment and awe.

"Its next returns were 1531 and 1607; in the former year it appeared of a bright gold colour, and in the latter it pursued nearly the same track through the heavens that it is at present traversing." In 1682, Dr. Halley and Flamsteed observed it in England: it was said by some to be as round and clear as the planet Jupiter, and that it had a tail of nearly 30 degrees in length. Dr. Halley then predicted its return in the latter part of 1758, or the beginning of 1759; its appearance answered the prediction. Another period of 75 years has elapsed, and it has fallen to the lot of the present generation to witness its return.

"When the Comet first became visible through the telescope, it appeared like an extremely faint nebula, or a minute portion of the milky way; it gradually increased in brilliancy as it approached our earth in its advance towards the sun, and about the middle or latter end of September, it was visible to the naked eye. On October the 6th and 10th, it was observed on the meridian below the pole, and on the 14th it was *sub polo* at Greenwich for the last time, but could not be observed on account of the clouds; it at this time exhibited a very brilliant tail of about six degrees long, but with a telescope of a very low power, the tail was traced to about twice that length, and viewed through such a telescope, it was a very beautiful object."

ECLIPSES IN 1836.

This year there will be Four Eclipses, two of the Sun and two of the Moon.

May 1.—Partial Eclipse of the Moon, invisible in this kingdom.

May 15.—Annular Eclipse of the Sun; visible in this kingdom. This Eclipse will be more or less visible to the inhabitants of Europe, the North and North-west of Asia, the North of Africa, North America, and the Northern parts of South America. It will appear central and annular, on a line crossing Mexico, the West Indies, the North of Ireland and England, and the South ot Scotland, through Germany, and as far as the Caspian Sea.

October 24.—Partial Eclipse of the Moon; invisible in this kingdom.

November 8 and 9.—Total Eclipse of the Sun; invisible in this kingdom.

SYNOPTICAL VIEW OF THE SOLAR SYSTEM.

The Sun is the source of light and heat to our system, and the most considerable of all the heavenly bodies, governing all the planetary motions. The true diameter of the Sun is upwards of 882,000 miles; its bulk is 1,384,000 times greater than the Earth. The Sun is surrounded by an atmosphere, and is oftentimes obscured with spots; some exceed the Earth four or five times in magnitude. The Sun revolves on its axis in about 25½ days.

Mercury is the nearest planet to the Sun, being about 36,000,000 miles from it. Performs its revolution round the Sun in 87 days 23 hours, which is the length of its year; its orbit is inclined to the plane of the ecliptic (that is, the plane in which the Sun always appears to move) at an angle of 70°; it revolves on its axis in 24 h. 5 m., which is the length of its day. The true diameter of Mercury is about 3,140 miles; its bulk 1-16th of the bulk of the Earth. The light and heat received from the Sun is about seven times greater than that received on the Earth.

Venus.—Distance from the Sun about 68,000,000 miles; the length of its year is 224 days 16 hours; its orbit is inclined to the plane of the ecliptic at an angle of 3° 23′; the rotation on its axis is 23 h. 21 m.; its true diameter is about 7,700 miles; and its bulk is about 9-10ths that of the Earth. Venus changes its phases, like the Moon, according to its positions to the Sun and Earth, which causes a considerable difference in its brilliancy. The light and heat received from the Sun is nearly twice as great as that received on the Earth. Venus is surrounded by an atmosphere, and is the most brilliant of all the planets: it has been repeatedly seen by the *writer* with the naked eye, about two o'clock in the afternoon of a fine clear day.

The Earth is also one of the planets that revolve about the Sun. Its mean distance is about 95,000.000 miles, and its diameter about 7,916 miles. It is accompanied by one satellite or moon.

Mars.—Distance from the Sun 142,000,000 miles; the length of its year is 686 days 23 hours; its orbit is inclined to the plane of the ecliptic at an angle of 1° 51′; the rotation on its axis is 24 h. 39 m.; its true diameter is about 4,100 miles, which is rather more than half the diameter of the Earth; its bulk is nearly 4-10ths that of the Earth. The light and heat received from the Sun is not quite half that received on the Earth. Mars changes its phases (somewhat as the Moon does from its first to its third quarter) according to its various positions with respect to the Sun and the Earth.

Vesta.—Discovered by Dr. Olbers, March 29, 1807. Mean distance from the Sun is about 225,000,000 miles; length of its year 1,325 days 17 hours; its orbit is inclined to the plane of the ecliptic at an angle of 7° 8′. The comparative insignificant dimensions of Vesta, as well as that of the three following planets, render them invisible, except through telescopes of considerable power; they have no assignable apparent diameter, and we have no knowledge of their absolute magnitude; owing to their minuteness they escaped observation till the beginning of this century.

Juno.—Discovered by Mr. Harding, Sept. 1, 1804. Mean distance from the Sun about 253,000,000 miles;

length of its year 1,593 days nearly; its orbit is inclined to the plane of the ecliptic at an angle of 13° 4'.

Ceres.—Discovered by M. Piazzi, Jan. 1, 1801. Mean distance from the Sun about 262,000,000 miles; length of year 1,681 days; orbit inclined to the plane of the ecliptic at an angle of 10° 37'.

Pallas.—Discovered by Dr. Olbers, March 28, 1802. Mean distance from the Sun about 268,000,000 miles; length of year 1,686 days 12 hours; orbit inclined to the plane of the ecliptic at an angle of 34° 35'

Jupiter.—Mean distance from the Sun 485,000,000 miles; performs its revolution in 4,332 days 14 hours; its orbit is inclined to the plane of the ecliptic 1° 19'. nearly; rotation on its axis is 9 h. 56 m.; its true diameter is 90,000 miles, and bulk is 1,281 times that of the Earth. The light and heat which it receives from the Sun is about 1-27th of that received on the Earth. Jupiter has four satellites or moons.

Saturn.—Distance from the Sun is above 890,000,000 miles; the length of its year is 10,759 days; its orbit is inclined to the plane of the ecliptic 2° 29': the length of the day is 10 hours 29 minutes; its true diameter is 76,068 miles; its bulk is 995 times that of the Earth. The light and heat received from the Sun is about 1-98th that received on the Earth. Saturn has seven satellites, and also surrounded with a double ring.

Georgium Sidus—Discovered by Sir William Herschell, on March 13, 1781. Its mean distance from the Sun is about 1,800,000,000 miles; it performs its revolution in about 84 years; its orbit is inclined to the ecliptic 46' only. The light and heat received from the Sun is only 1-3000th part of the quantity received on the Earth. This planet has six satellites.

METEOROLOGY, &c.

The study of meteorology is highly interesting, inasmuch as we all have a concern in the state of the weather, and are therefore naturally prompted to inquire into the causes of its phenomena. Besides, it is beginning to assume the regularity of a science, while it shows that the Creator has set bounds to variation which it cannot pass, and made sundry apparently conflicting causes to join together in advancing one gracious and beneficent purpose, the welfare of man and the creatures which He has formed for his service.

Evaporation.—If an earthen pan full of water be placed in the open air, and allowed to remain in that situation for some time, the water is found to decrease by little and little, till the whole is consumed. As we are convinced that in glazed pottery it did not ooze through the sides, it could have passed in no direction but that aloft into the atmosphere. In a manner unseen by the human eye, the heat combines with the water, imparts elasticity to this new combination, by which it is borne into the regions above us. This process is called *evaporation*, and the quantity of water which a pan or other vessel would lose in a given time, is called the evaporation for that period. If the inside were graduated, or marked with inches, like an apothecary's measure, we should be able to tell how many inches and parts of an inch it had *evaporated* in a given time. If an experiment were tried in the month of July, we should find that during that time the water had been lowered in the pan by 4.111 inches; this we should call the *evaporation* for July, which on an average is the greatest of any month in the year. The only caution necessary is to protect the pan from the rain, by some sort of shelter, without intercepting the rays of the sun in their descent upon it.

Rain.—Rain is only the inverse of evaporation; the former as gain, the latter as loss. It would be measured by a vessel marked with inches, in the same way as the evaporation, did not the water, as soon as the shower was over, begin to waste. To obviate this inconvenience, and to set the matter in a lively manner before our senses, we will suppose a glass tube, marked with inches, and furnished with a funnel at the top, corresponding with the size of the tube, which would allow the water to enter without allowing the vapour to escape. The number of inches and parts which the water would ascend in the tube during a month would be the *rain* for that period.

Dew Point.—As the combined result of the process of evaporation is constantly carried on at the surface of a piece of water, there must be at all times a certain quantity of invisible vapour in the atmosphere. A question here naturally arises, What is the temperature of that vapour? This might be determined if we could dip the thermometer into it apart from the atmosphere, as we do when we wish to ascertain the exact heat of water; but as this is not possible, it must be attempted by some indirect method which will amount to the same thing. We learn from observation, that if any of the heat be abstracted from this vapour, it falls and settles in the shape of dew upon the nearest object. By means of an instrument, called an hygrometer, we can tell the temperature of the vapour at this moment, and consequently arrive at the very next step below its heat while in a state invisible to the human eye. The point at which the thermometer stands, when placed within the instrument at the moment when the dew begins to fall upon a glass-ball on the outside of it, is called the *dew point*. Since the quantity of vapour is directly as the quantity of heat which it contains, we may consider the quantity of vapour as measured by the heat, and, in speaking, use that term instead of temperature; and thus we may say there is the least quantity of vapour in the atmosphere in January, and the greatest in August, because we find the dew-point, or the temperature of the vapour, for one 34.3°, and, for the other, 55.3°. The more vapour there is in any given space, the greater of course is its weight or density, and the greater is the force with which it would resist any body that attempted to pass through it. Hence these terms, *density*, *force*, and *elasticity* of vapour are often applied to it.

Solar Radiation.—This implies the difference between the point at which a thermometer stands when placed under favourable circumstances in the sun, and one in the open air, but defended from the direct rays of that luminary; in short, it is the difference between shade and sunshine.

Terrestrial Radiation.—If one thermometer be set close to the ground, and one suspended a few feet above it, during the night, and their difference be noted, this is called the terrestrial radiation.

BAROMETER.

We are grown so familiar with this instrument, and so much accustomed to look for fair weather when it is high, and foul when the mercury sinks, that we forget to reflect upon the curious truth which it tells, and think too much upon that which is uncertain, to be sufficiently curious to learn what is certain. It informs us that a column of air, equal to the tube in diameter, but perhaps fifty miles in height, weighs just so much, which may be ascertained correctly, by simply weighing the mercury contained in that tube. It has long been a matter of observation, that northerly winds raise, and southerly winds depress the barometer: these winds alter the weight of the atmospheric column. It usually stands highest during the winter months, at which time the range is greatest. To speak in simple terms, we may say, in winter it rises higher and sinks lower; in summer it does not sink so low nor rise so high; and hence, by taking a mean between its highest and lowest points, at the opposite seasons, we are led to this curious fact, that the air is heavier in summer than in winter.

A Flake of Snow.—When storms and showers of snow " deform the day delightless," we may find entertainment in studying the shape, or rather the arrangement of a flake of snow. It is vapour, in a state of crystallization, having undergone this process in the magazine of vapour from whence it came. Each flake is a collection of crystals, which are often disposed in the form of a six-rayed star, and thus divide the circle of 360 degrees into angles, which approach more or less to sixty degrees. These six rays diverge into secondary branches at the aforesaid angle from each other. The hoar-frost consists of two kinds; one, in which it shoots into needle-like points, when it is said to be *spicular*, and perhaps is caused by the vapour which congeals at the moment of coming into contact with the object; the other kind consists of minute grains from the dew, which was turned to a solid as it rested upon the herbage.